

Work Order ID 60979

August 3, 2010 1:50:21 PM



Page 1

Item ID: D407-667-205TRN

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Turning Detail

Start Date: 8/03/10 Start Qty: 1.00

Required Date: 8/10/10 Req'd Qty: 1.00



Cust Item ID:

Customer:

Reference:

Run Start

Approvals: Process Plan: *[Signature]*

Date: 10-8-03

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr
D407-667-245	Rev F

100 0.00



Mori Seiki

MORI SEIKI CNC LATHE LARGE

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs DT8531 on both ends as per Folio FA248
2-Turn first side as per Folio FA248 3- File transition lines smooth.

Q.M. 10-08-09 @

110 0.00



QC

QC1- Inspect dimensions to dimension sheet

Memo

0.00

Quality Control

Q.M. 10-08-09 @

120 0.00



Mori Seiki

MORI SEIKI CNC LATHE LARGE

Memo

0.00

Mori Seiki CNC Lathe Large

1-Turn second side as per Folio FA248 2- File transition lines smooth. 3-
Remove sand and plugs 4-Scribe part # and batch # using vibrating stylus as
per Dwg D407-667-245 Inside of Cuff (Donot engrave on outside of tube)

Q.M. 10-08-09 @

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)							
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector	
			Initial Chief Eng	Action Description Chief Eng	Sign & Date				

NOTE: Date & initial all entries

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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run

Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130 QC Quality Control	QC1- Inspect dimensions to dimension sheet Memo	0.00 0.00				0.1	10	08	09 (1)
140 QC Quality Control	QC8- Inspect parts - second check Memo	0.00 0.00				(1x)	10	08	09 (1)
150 HandFXtube Hand Finishing Crosstubes	Crosstubes Chemical Conversion Memo Ensure no sand is in the tube before alodine.	0.00 0.00				0.1	10	08	09 (1)

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Page 3

Item ID: D407-667-205TRN

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Setup

Start



Revision ID:

Item Name: Crosstube Turning Detail

Stop



Start Date: 8/03/10 Start Qty: 1.00



Cust Item ID:

Required Date: 8/10/10 Req'd Qty: 1.00



Customer:

Reference:

Run

Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

160

QC3- Inspect Part Finish

0.00

QC
Quality Control

Memo

0.00

(IX)

MB

10-08-09

170

Packaging

0.00

Packaging
Packaging

Memo

Identify and stock in kanban rack ☐ Location: X-tube cul

0.00

(IX)

MB

10-08-09

180

QC21- Final Inspection - Work Order Release

0.00

QC
Quality Control

Memo

0.00

10/08/10
MF
10-8-10

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Picklist Print

August 3, 2010 1:50:25 PM

Page 1

Work Order ID: 60979



Parent Item: D407-667-205TRN



Parent Item Name: Crosstube Turning Detail

Start Date: 8/03/10

Required Date: 8/10/10

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A 08-03-06 new issue DD verified by:ec
 IPP Rev B 08.04.02 Removed polish EC verified by: DD
 IPP Rev:C 08-08-19 revE as per dwg DD verified by:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6011-115 		Manufactured	No			120	Each	6.0000	1	1			
Crosstube Material													
<div> <div>Location</div> <div>Loc Qty</div> <div>Loc Code</div> </div>													
<div> <div>LG</div> <div>6</div> <div></div> </div>													
<div> <div>58413</div> <div>6</div> <div></div> </div>													

A.M 10-08-09

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NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order:	60279
Description: Crosstube Assembly		Part Number:	D407-667-245
Inspection Dwg: D407-667-245 Rev: F		Page 1 of 1	

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.490	+0.005/-0.000	2.490	/		Caliper am-04
	1.832	+0.005/-0.000	1.836	/		
	1.838	+0.005/-0.000	1.840	/		
	1.892	+0.005/-0.000	1.895	/		
	2.052	+0.005/-0.000	2.055	/		
	2.206	+0.005/-0.000	2.209	/		
	2.521	+0.005/-0.000	2.526	/		
	2.633	+0.005/-0.000	2.636	/		
	4.10	+/-0.030	4.10	/		
	4.978	+/-0.030	4.978	/		
	2.040	+0.000/-0.010	2.040	/		
	0.125	+/-0.010	0.125	/		
	R0.063	+/-0.010	R0.063	/		
	R0.500	+/-0.010	R0.500	/		
SIDE B	2.490	+0.005/-0.000	2.490	/		Caliper am-04
	1.832	+0.005/-0.000	1.836	/		
	1.838	+0.005/-0.000	1.840	/		
	1.892	+0.005/-0.000	1.895	/		
	2.052	+0.005/-0.000	2.055	/		
	2.206	+0.005/-0.000	2.209	/		
	2.521	+0.005/-0.000	2.526	/		
	2.633	+0.005/-0.000	2.636	/		
	4.10	+/-0.030	4.10	/		
	4.978	+/-0.030	4.978	/		
	2.040	+0.000/-0.010	2.040	/		
	0.125	+/-0.010	0.125	/		
	R0.063	+/-0.010	R0.063	/		
	R0.500	+/-0.010	R0.500	/		
	112.91	+/-0.020	112.910	/		Taper measure am-01

Measured by:	an	Audited by:	MB	Prototype Approval:	N/A
Date:	10-08-09	Date:	10-08-09	Date:	N/A

Rev	Date	Change	Revised by	Approved
A	04.04.21	New Issue (P/O D407-667-205)	KJ/RF	
B	06.03.09	Dwg Rev updated	KJ/JLM	
C	06.03.30	Tolerance revised for 4.978 dimension	KJ/JLM	
D	07.02.19	Dwg Rev updated	KJ/JLM	
E	09.05.20	Dwg Rev updated	KJ	

Item	QTY -245	PART NUMBER	DESCRIPTION
1	X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
2	1	D6011-115	CROSSTUBE
3	2	D2856-400-773	ABRASION STRIP
4	2	D2873-043	NUT PLATE
5	2	D2873-045	NUT PLATE
6	1	D2894-1	SUPPORT
7	2	D3190-1	CHAFING SHIELD
8	2	D3595-063-430	RUBBER CUSHION
9	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
10	4	MS21920-22	CLAMP
11	2	MS21920-25	CLAMP (OR MS21920-24)
12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947- 100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6011-115
FINISHED LENGTH = 112.91±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER 'D407-667-245' AND BATCH NUMBER ON
INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 27.7 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO
BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND
6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO
PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1
SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE
SUPPORT.
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS.
ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF
CROSSTUBE, PER QSI 035.
- 16) INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS ON BOTTOM SIDE OF CROSSTUBE
OPPOSITE D2894-1 SUPPORT.
- 17) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN
SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

60980 Bfio-8-03
ON
WORK ORDER
WITHOUT NOTICE
SUBJECT TO AMENDMENT
UNCONTROLLED COPY
ENGINEERING
RETURN TO
SHOP COPY

RELEASED
8/11/12 N/A

F	REFORMAT NOTES TO NEW STANDARDS (ZN B8-1); RELOCATED FLAG # 6 (ZN A8-3) PER NCR 210; REMOVED REF. & ADD TOLERANCES (ZN C6-3, C4-3 & D2-3)	RF	08.11.06
E	8.02 AND 8.53 WERE 8.40 AND 8.90 (ZN D5-2); REORGANIZED VIEWS AND REFORMATED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: PAR#08-21 AND EGN#1225	MB	08.07.24
D	ADD VIEW FOR OEM SKID HOLES, ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -851 ABRASION STRIP, ADD MAGNOBOND 6398, ADD CUSHION	PH	07.02.07
C	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.07.26
B	ADD CHAFING SHIELD	CP	03.05.21
A	NEW ISSUE	CP	02.05.13
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	RF	DRAWING NO.	REV. F
MFG. APPR.	RF	D407-667-245	SHEET 1 OF 4
APPROVED	RF	TITLE	SCALE
DE APPR.	RF	CROSSTUBE ASSY (407 HIGH AFT)	NTS
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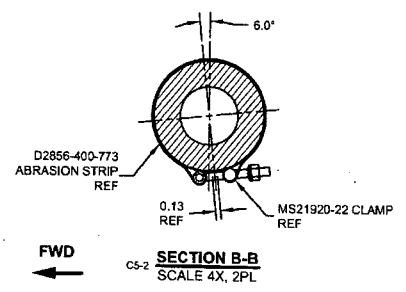
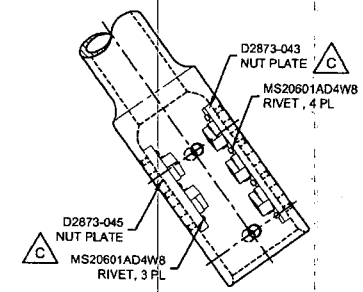
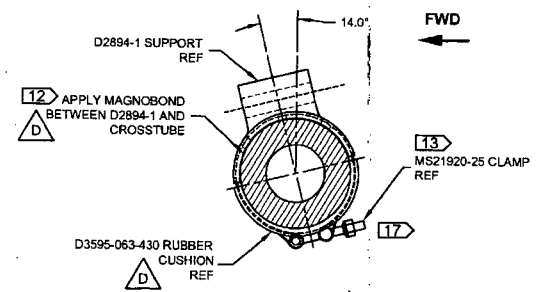
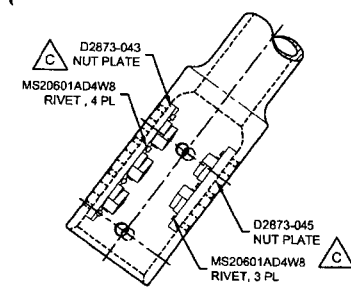
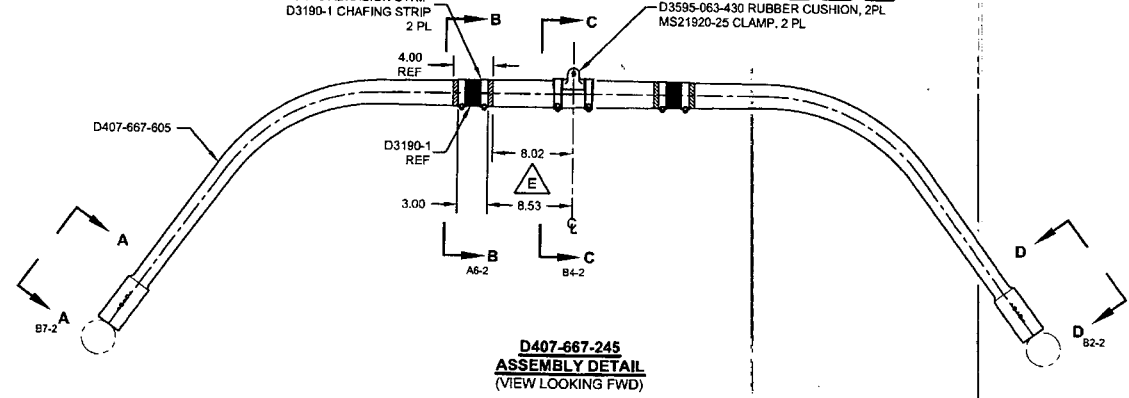
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NOTE: Date & initial all entries

16 15 MS21920-22 CLAMP, 2 PL
 D2856-400-773 ABRASION STRIP
 D3190-1 CHAFING STRIP
 2 PL
 4.00 REF
 D2894-1 SUPPORT 12 13 17
 D3595-063-430 RUBBER CUSHION, 2PL
 MS21920-25 CLAMP, 2 PL



RELEASED

DESIGN	90	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	90	DRAWING NO.	REV. F
MFG. APPR.	90	D407-667-245	SHEET 2 OF 4
APPROVED	90	TITLE	SCALE
DE APPR.	90	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
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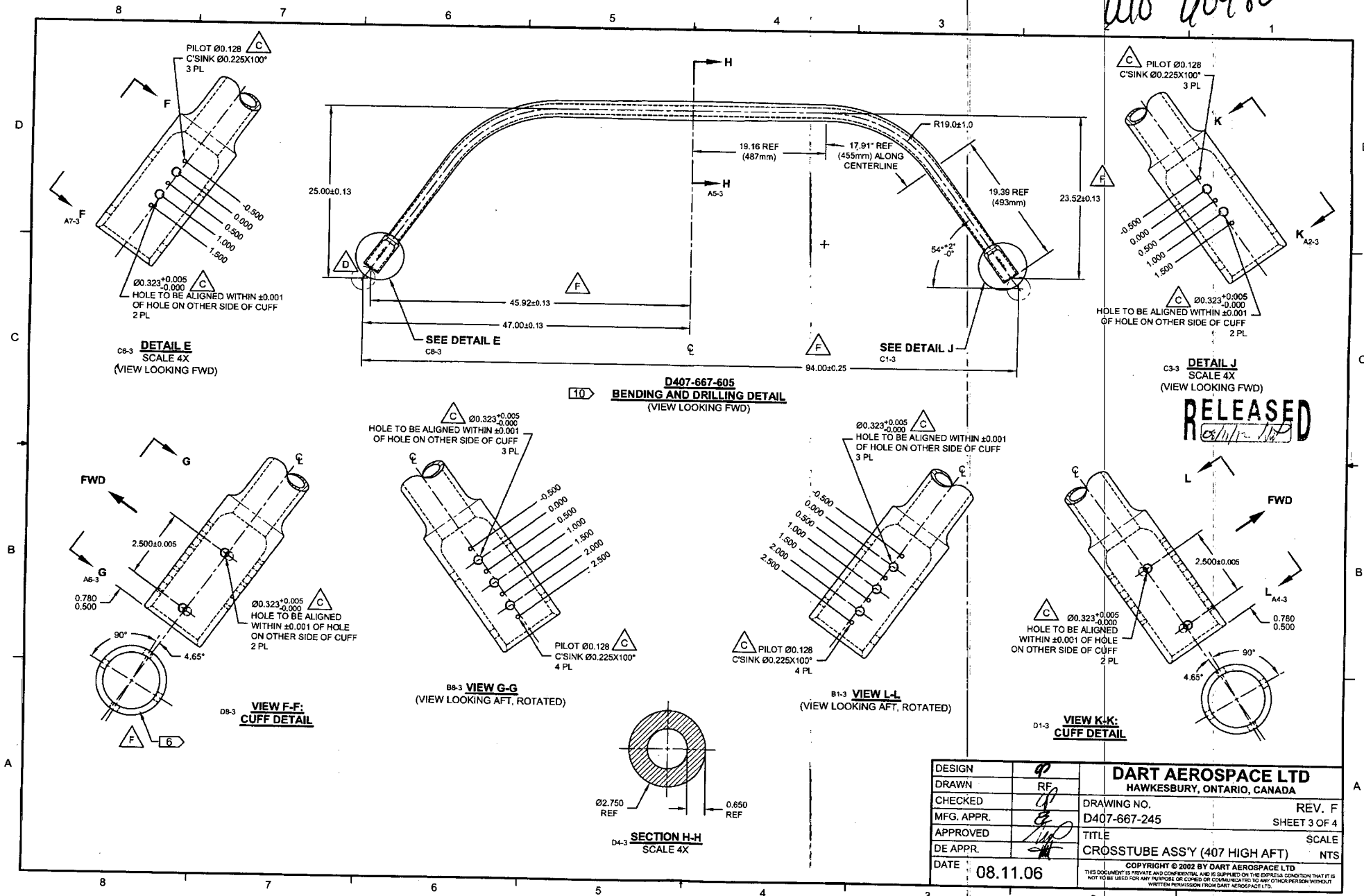
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ULO 40980



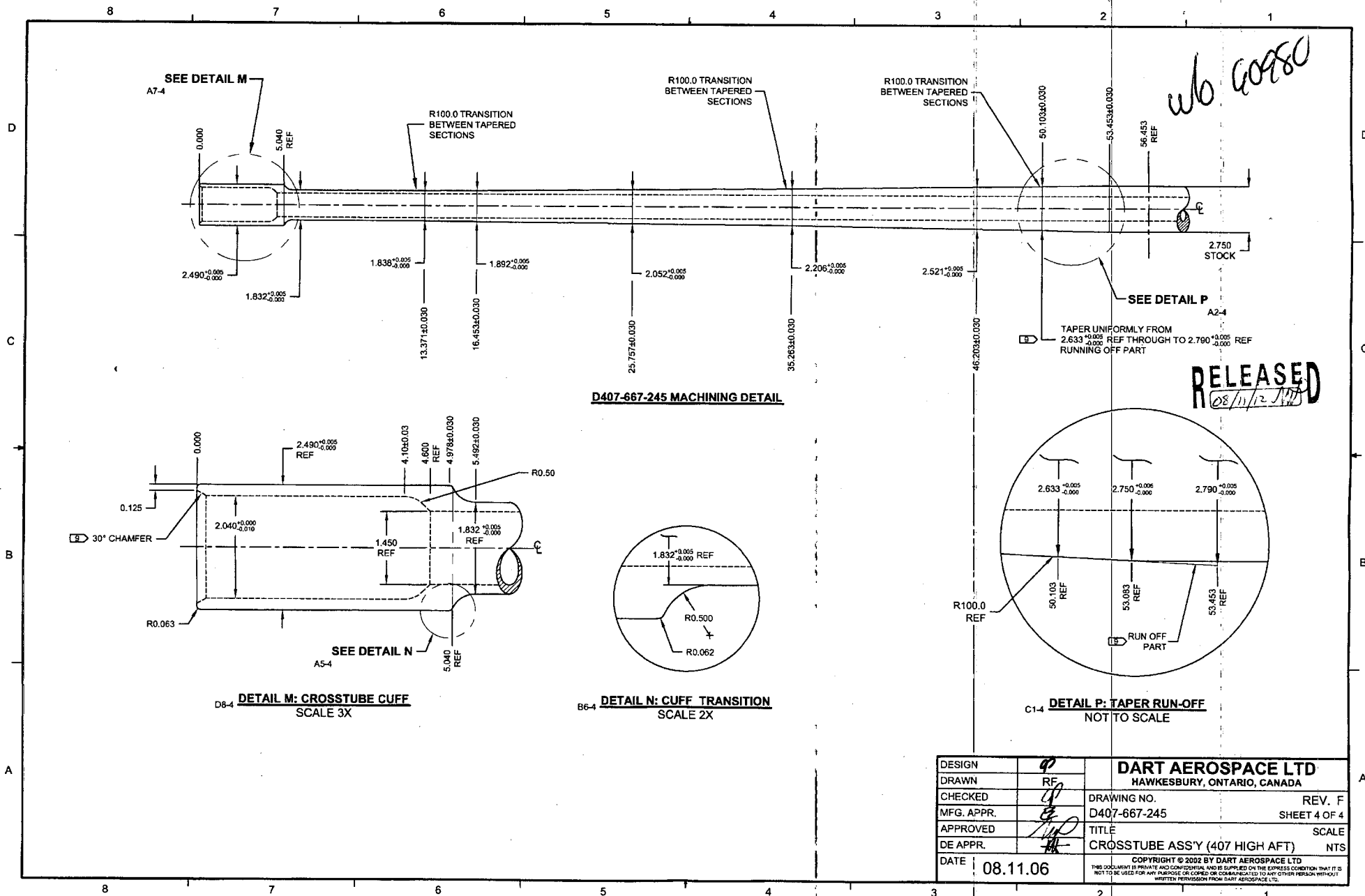
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MFG. APPR.	LP	D407-667-245	SHEET 4 OF 4
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